

USSR

UDC 537.563.547.23

FRIDLYANSKIY, G. V., PAVLENKO, V. A., VINOGRADOV, B. A., GRISHIN, N. N.,
BOGOLYUBOV, G. M., and PETROV, A. A., Leningrad Technological Institute imeni
Lensovet

"Organic Derivatives of Group V-VII Elements. XX. Exact Composition of Ions
in Mass Spectra of Alkylphosphine Sulfides and P=S Bond Strength"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 8, Aug 71, pp 1707-1709

Abstract: The article describes results of the measurement of mass numbers of ions in mass spectra for triethylphosphine sulfide and tetraethyldiphosphine disulfide on a double-focusing mass spectrometer. The dissociation energy of the P-P bond in tetraethyldiphosphine disulfide was previously found by the authors from the appearance potential of the ion $(M/2)^+$. Precise measurement of the mass in the present article confirms the composition assigned to this ion. The dissociation energy of the P=S bond was found to be equal to 3.7 eV or 85 kcal/mole, which is in satisfactory agreement with the value obtained from the thermal effect of the tripropylphosphine oxidation reaction (91.6 kcal/mole). Determination of the exact composition of ions in the mass spectra of alkylphosphine sulfides shows the resistance of the P=S bond to the action of an electron impact. This resistance is characteristic of the chemical bonds between atoms of Group V and VI elements possessing unshared electron pairs.

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UDC 537.563:547.242

BOGOLYUBOV, G. M., GRISHIN, N. N., and PETROV, A. A., Leningrad Technological Institute imeni Lensovet

"Organic Derivatives of Group V-VII Elements. XXI. Mass Spectra of Trialkylarsines and Tetraalkyldiarsines. Effect of Alkyl Substitution on Bonding Strength of Adjacent Heteroatoms"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 8, Aug 71, pp 1710-1714

Abstract: The authors took mass spectra of triethyl-, tripropyl-, tributylarsines and tetraethyl-, tetrapropyl-, tetrabutylarsines and determined appearance potentials of the basic ions. The mass spectra of trialkylarsines and tetraalkyldiarsines display features characteristic of alkyl derivatives of Group V and VI elements of the third and higher periods, i.e. high intensity of molecular ions and predominance of ions formed with cleavage of E-C bonds as compared to ions formed with cleavage of E-E bonds (where E is an atom of a Group V or VI element possessing unshared electron pairs). A comparison of dissociation energies of E-E bonds in alkyl derivatives with dissociation energies of diatomic molecules E_2 indicates that alkylation weakens the bond strength of adjacent heteroatoms.

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USSR

UDC 537.563:547.241

BOGOLYUBOV, G. M., GRISHIN, N. N., and PETROV, A. A., Leningrad Technological
Institute imeni Lensovet

"Organic Derivatives of Group V-VII Elements. XVIII. Conjugation Energy
of the P-P Bond. Mass Spectra of Phosphine Sulfides"

Leningrad, Zhurnal Obshchey Khimii, Vol 41 (103), No 4, Apr 71, pp 811-815

Abstract: The conjugation energy of the P-P bond in tetraethyldiphosphine was found to be of the order of 25 kcal/mole. Phosphorus atoms in this molecule have unshared pairs of electrons. Studying the electron spectra, dipole moments and the dissociation energy of the E-E type of compounds, where E= an element of the V, or VI group possessing an unshared pair of electrons, it was found that the conjugation between elements led to an increased resistance of the E-E bond to electron attack. Yet at the same time these compounds are highly susceptible to the action of nucleophilic agents. This phenomenon has been explained by an anti-ion participation in their chemical reactions.

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UDC 547.242

BOGOLYUBOV, G. M., PETROV, A. A., Leningrad Technological Institute Imeni Lensovet, Leningrad, Ministry of Higher and Secondary Specialized Education USSR

"Organic Derivatives of the V and VI Group Elements. XIV. Ammoniacal Synthesis of Tetraalkyldiarsines"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 8, Aug 70, pp 1795-1796

Abstract: Metallic arsenic may be alkylated in an ammonia solution of alkali metals; this appears to be a useful preparative route for arsines and polyarsines. One g-atom of lithium was slowly added to 0.5 g-atom of ground arsenic in 1 liter liquid ammonia; the mixture was stirred until a light greenish-yellow solution was formed. Then 1 g-mole of ethylbromide was added dropwise, the solution changing to red and finally to gray. Most of the ammonia was evaporated, 200 ml of absolute ether added, and the mixture stirred until the color ceased bleaching out. The ether solution was decanted under an atmosphere of argon, the solvent evaporated, and 1/2

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BOGOLYUBOV, G. M., et al, Zhurnal Obshchey Khimii, Vol 40, No 8, Aug 70, pp 1795-1796

tetraethyl diarsine distilled under reduced pressure. Alkyl chlorides, bromides, or iodides may be used in this reaction. The activity of V and VI group elements in this ammoniacal synthesis is proportional to their semiconductive properties.

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USSR

UDC 537.563:547.341

BOGOLYUBOV, G. M., PLOTNIKOV, V. F., IGNAT'YEV, V. M., and IONIN, B. I.,
Leningrad Technological Institute imeni Lensovet

"Organic Derivatives of the V-VII Group Elements. XV. Mass-Spectra of
Unsaturated Phosphine Oxides"

Leningrad, Zhurnal Obshchey Khimii, Vol 41 (103), No 3, Mar 71, pp 517-520

Abstract: Mass spectra and appearance potentials of the basic ions of diethylpropylphosphine, diethyl-trans-propenylphosphine, diethyl-cispropenylphosphine, diethylpropenylphosphine, and diethylallenylphosphine oxides are reported. Only few peaks with intensities higher than 10% appear in these spectra. The intensity of molecular and β -ions is small, the α - and π -ions predominating there. The intensity values M^+ in the mass spectra obtained agree with the localization of the positive charge on the molecular ion of phosphine oxides, specifically at the oxygen atom of the phosphoryl group. The relationship between the intensities of positive molecular ions and of the rear-ranged ones indicates intramolecular hydrogen bonding in trans-diethylpropenylphosphine oxide. Mass spectral conversions of phosphine oxides depend on participation of ionic mesomeric system including phosphoryl group.

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1/2 020 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--MASS SPECTRAL RANGE OF ACID BASE PROPERTIES -U-
AUTHOR--BOGOLYUBOV, G.M. *B*
COUNTRY OF INFO--USSR
SOURCE--ZH. OBSHCH. KHIM. 1970, 40(3), 705
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--MASS SPECTRUM, HYDROGEN ION CONCENTRATION, ORGANIC NITRO
COMPOUND, MERCAPTAN, ACETYLENE, ALKANE, ALKENE, AROMATIC HYDROCARBON,
HETEROCYCLIC BASE COMPOUND
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--2000/0866 STEP NO--UR/0079/70/040/003/0705/0705
CIRC ACCESSION NO--AP0124529
UNCLASSIFIED

2/2 020

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0124529

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A CORRELATION WAS FOUND BETWEEN PK SUBA WITH MASS SPECTRAL INTENSITIES OF MOLECULAR IONS M PRIME POSITIVE IN THE PK RANGE FROM 9 TO 40 AMONG NITRO COMPOS., MERCAPTANS, ACETYLENES, AROMATIC HYDROCARBONS, OLEFINS AND ALKANES. THE DECIDING FACTOR IN THE CORRELATION IS THE DEGREE OF CONSIDERATION GIVEN TO THE BASICITY OF THE COMPD. IN QUESTION. AS A RESULT IT IS POSSIBLE TO CLASSIFY COMPOS. INTO THE FOLLOWING GROUPS: COMPARATIVELY LARGE ACIDITY AND BASICITY, COMPARATIVELY SMALL ACIDITY AND BASICITY, AND COMPOS. WITH LARGE ACIDITY AND LOW BASICITY OR THE REVERSE. THE LATTER 2 GROUPS INCLUDE NITRO COMPOS. AND FLUORINATED COMPOS. IN THE 1ST CATEGORY, AND SATD. HETEROCYCLES IN THE 2ND. IN EACH VARIANT IT IS POSSIBLE TO PREDICT THE PECULIARITIES OF MASS SPECTRA FROM CONSIDERATION OF CHANGES IN THE MODE OF CLEAVAGE OF THE PRIMARY COMPLEX IN RESPECT TO CHANGE IN THE ACIDITY BASICITY RELATIONSHIP. FACILITY: LENINGRAD. TEKHNOL. INST. IM. LENSOVETA, LENINGRAD, USSR.

UNCLASSIFIED

BOGOLYUBOV N.N.

MATHEMATICAL PROBLEMS OF QUANTUM FIELD THEORY
AND QUANTUM STATISTICS

(Conference in Moscow)

Article by academicians M. Bogolyubov and V. S. Vladimirov, Moscow, Vsesoyuznaya Akademiya Nauk SSSR, Russian, November 1977, pp. 113-110

1978-09-18
6 Aug 78
(in SSSR AC 1978)

(1) B

In the last 15-20 years the establishment of a new scientific direction -- contemporary mathematical physics, occupying an intermediate position between theoretical physics and mathematics -- has proceeded intensively. That direction was called into being by problems of the quantum physics of systems with an infinite number of degrees of freedom -- relativistic and non-relativistic -- and requires the drawing in of powerful means of contemporary mathematics, such as generalized functions, functions of complex variables, functional analysis, group concepts, algebraic topology, C*-algebras, etc.

A very important stage in the development of this new direction was work done in the USSR in the 1950s, namely: the construction of a renormalization procedure on the basis of the technique of multiplication of generalized functions and the construction of the first mathematically correct proof of dispersion relations on the basis of the theory of analytic continuation of generalized functions. It was precisely after that work that the theoretical physicists realized the need for a more profound understanding of the mathematical nature of a number of subjects which they encountered in their investigations. On the other hand, theoretical physics itself was a rich source of new mathematical problems and methods. The attention of theoretical physicists and mathematicians of many countries was attracted to the new direction.

Testifying to the continuing active development of contemporary mathematical physics was the International Conference

Superconductivity

USSR

UDC 539.1

BOGOLYUBOV, N. N., Joint Institute of Nuclear Research, Dubna

"The Question of a Model Hamiltonian in the Theory of Superconductivity"

Moscow, Problemy Fiziki Elementarnykh Chastits i Atomnogo Yadra, Vol 1,
No 2, 1971, pp 301-364

Abstract: The author examines a system of fermions with an attractive force that can be described by a model Hamiltonian of the theory of superconductivity with a factorizing nucleus. He finds the asymptotically precise (when $V \rightarrow \infty$) evaluations for the minimal eigenvalue of the Hamiltonian, the correlation functions, and the Green function. The problem is first formulated; the simplest model system that can be studied in the theory of superconductivity is characterized by a Hamiltonian in which the interaction of particles is left only with the opposite impulses and spins. Here the problem will consist of finding evaluations for the deviations of the eigenvalues \mathcal{H}_0 and \mathcal{H} and for the deviations of the respective Green functions. The author shows that these deviations disappear in the process of the limiting transition $V \rightarrow \infty$. He then describes the general properties of the Hamiltonian and proceeds to study the eigenvalue of the $1/2$

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BOGOLYUBOV, N. N., Problemy Fiziki Elementarnykh Chastits i Atomnogo Yadra, Vol 1, No 2, 1971, pp 301-364

Hamiltonian described in formula (1.2) from above. He proves the theorem that by using \mathcal{H}_0 it is possible to obtain an asymptotically precise solution for \mathcal{H} when $V \rightarrow \infty$. The next section is concerned with evaluating the eigenvalue of the Hamiltonian from below, and the author finds that the correlation means involved for the Hamiltonian \mathcal{H} are asymptotically equal to the respective means for the Hamiltonian \mathcal{H}_0 .

He then occupies himself with asymptotic evaluations for the Greenfunction and the correlation means in the case $\lambda \neq 0$ and finds that the solution to the equations for the green functions constructed on the Hamiltonian \mathcal{H}_0 will asymptotically differ only slightly from the respective solutions for such a model Hamiltonian \mathcal{H} when $V \rightarrow \infty$. The next problem is a discussion of the Green function for the case $\lambda = 0$, which the author proves in some detail. The author concludes with two appendices that involve treatment of particular phases of the problem. The article contains 12 bibliographic entries.

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USSR

BOGOLYUBOV, N. N., VLADIMIROV, V. S., and TAVKHELIDZE, A. N.

"Self-Modeling Asymptotic Behavior in Quantum Field Theory, Part I"

Moscow, Teoreticheskaya i Matematicheskaya Fizika, Vol 12, No 1, 1972, pp 3-17

Abstract: This paper is the first part of a series dealing with the theory of highly inelastic processes in the interaction of leptons and nucleons. The authors begin their analysis with a Fourier transform useful in the process of the highly inelastic dispersion of an electron by a nucleon, and they propose a method for investigating the asymptotic behavior of the form factors for that transform on the basis of the general principles of local quantum field theory. They indicate the conditions under which self-modeling behavior of the form factors occurs in the asymptotic region and derive a connection between the nature of the self-modeling and the analysis of the dimensionality. It is asserted that this method can be extended to the general problem of the highly inelastic interactions of leptons and nucleons. The authors express their gratitude to D. I. Blokhintsev, A. A. Logunov, A. A. Markov, V. A. Matveyev, R. M. Muradyan, O. A. Khrustalev, V. P. Shelest, and D. V. Shirokov; they are associated with the V. A. Steklov Mathematical Institute of the Joint Institute for Nuclear Research, USSR Academy of Sciences.

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Acc. Nr.: 4M0046191

B

Ref. Code: UR0000

Bogolyubov, N. N.; Logunov, A. A.; Todorov, I. T.

Principles of Axiomatic Approach in Quantum Field Theory (Osnovy aksiomaticheskogo podkhoda v kvantovoy teorii polya) Moscow, Nauka, 424 pp (SL:1904)

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Reel/Frame

19781277

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AM0046191

The monograph contains a systematic presentation of various trends
of the axiomatic approach...

LD

19781278

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1/2 007

UNCLASSIFIED

PROCESSING DATE--27NOV70

TITLE--ON A SIGN OF AN IMAGINARY PART OF QUASI POTENTIAL -U-

AUTHOR--BOGOLYUBOV, P.N.

COUNTRY OF INFO--USSR

SOURCE--(JINR P2 5021) 1970, IIP: DEP. CFSTI

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--NUCLEAR POTENTIAL BARRIER, COMPLEX FUNCTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRA--3001/1552

STEP NO--UR/0000/70/000/000/0011/0011

CIRC ACCESSION NO--AT0127048

UNCLASSIFIED

2/2 007

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AT0127048

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IT IS SHOWN THAT IN THE EXPRESSION
FOR QUASI POTENTIAL THERE APPEARS A POSITIVE IMAGINARY PART.

FACILITY: JOINT INST. FOR NUCLEAR RESEARCH, DUBNA (USSR). LAG. OF
THEORETICAL PHYSICS.

UNCLASSIFIED

USSR

UDC 537.563:547.341

BOGOLYUBOV, T. M., ZUBTSOVA, L. I., GRISHIN, N. N., RAZUMOVA, N. A., and PETROV, A. A., Leningrad Technological Institute imeni Lensovet

"Organic Derivatives of the V-VII Group Elements. XVII. Mass-Spectra of Phosphine Derivatives"

Leningrad, Zhurnal Obshchey Khimii, Vol 41 (103), No 3, Mar 71, pp 527-530

Abstract: Fragmented ions formed during mass-spectroscopical analysis of phosphines and phosphine oxides retain the positive charge on fragments containing heteroatoms. In this paper mass-spectra of phosphine oxides are reported, where this tendency does not exist. The spectra show high intensity of the molecular ion and fragmented hydrocarbon ions, in contrast to phosphates, phosphonates, and phosphine oxides. The predominance of fragmented hydrocarbon ions may be related to the presence of electron accepting substituents of the phosphorus atom. The intensity of the fragment ion m/e 54 correlates qualitatively with the activity of organophosphorus compounds in nucleophilic substitution reactions at the tetrahedral phosphorus atom.

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1/2 019 UNCLASSIFIED
TITLE--COMPLEX ALLOY FOR ALLOYING STEEL -U-

PROCESSING DATE--27NOV70

AUTHOR--(02)-KUMYSH, I.S., BOGOLYUBOV, V.A.

B

COUNTRY OF INFO--USSR

SOURCE--U.S.S.R. 265,456

REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,

DATE PUBLISHED--09MAR70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--ALLOY STEEL, ALUMINUM CONTAINING ALLOY, CARBON ALLOY, IRON
CONTAINING ALLOY, NIOBIUM CONTAINING ALLOY, SILICON CONTAINING ALLOY,
TITANIUM CONTAINING ALLOY, METALLURGIC PATENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/1067

STEP NO--UR/0482/70/000/000/0000/0000

CIRC ACCESSION NO--AA0130102

UNCLASSIFIED

2/2 019

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AA0130102

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TITLE ALLOY HAS THE FOLLOWING
COMP. (IN WT. PERCENT): TI 20-35, NB 10-30, AL 5-15, SI SMALLER THAN
OR EQUAL TO 0.1, AND FE THE REMAINDER. FACILITY: BARDIN, I. P.,
CENTRAL SCIENTIFIC RESEARCH INSTITUTE OF FERROUS METALLURGY.

UNCLASSIFIED

1/2 024 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--A COMPARATIVE VALUE OF CLINICO ROENTGENOLOGICAL SYMPTOMS OF
POSTINFARCTION CARDIAC ANEURYSMS -U-
AUTHOR-(03)-ASTAPOV, B.M., BUGOLYUPOV, V.M., KUZNETSOV, N.S.
COUNTRY OF INFO--USSR
SOURCE--KLINICHESKAYA MEDITSINA, 1970, VOL 48, NR 3, PP 42-46
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--HEART DISEASE, ANEURYSM, RADIOGRAPHY, DIAGNOSTIC MEDICINE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3002/1707 STEP NO--UR/0497/70/048/003/0042/0046
CIRC ACCESSION NO--AP0129077
UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0129077

ABSTRACT/EXTRACT--(U) GP-C- ABSTRACT. THE PAPER DEALS WITH OBSERVATIONS OVER 51 PATIENTS WITH POSTINFARCTION CARDIOSCLEROSIS, FO THE LATTER IN 14 CASES ANEURYSMOF THE LEFT CARDIAC VENTRICLE WAS REVEALED. THE CLINICAL SYMPTOMS ARE DESCRIBED AND THE IMPORTANCE OF THE X RAY METHOD IN THE RECOGNITION OF CARDIAC ANEYRYSM IS EMPHASIZED. THE SIGNS OF THIS DISEASE ARE DISCUSSED IN DETAIL. ON THE BASIS OF CONTRONTATION OF DATA OF ROENTGENOLOGICAL STUDY, SCANNING OF THE CARDIAC CAVITIES, CLINICAL INVESTIGATION AND, IN A NUMBER OF CASES, AUTOPSY FINDINGS OR DYNAMIC OBSERVATION THE AUTHCKS REVIEW THE VALUE OF ROENTGENOLOGICAL SIGNS DURING ROUTINE X RAY INVESTIGATION, ROENTGENOSCOPY, AIMED AND WIDE RANGE ROENTGENOGRAPHIES WITH ROENTGENOGRAMMOMETRY. EMPHASIS IS MADE OF THE FACT THAT SUCH AN X RAY INVESTIGATION DOES NOT ALWAYS ESTABLISH THE DIAGNOSIS OF CARDIAC ANEURYSM, THIS COMPELLING TO SUSPECT THE LATTER AND TO TRANSFER TIMELY THE PATIENT FOR SPECIAL STUDY, INCLUDING ROENTGENCKYMOGRAPHY AND ELECTROKYMOGRAPHY. THE REFERRED TO TECHNIQUES ARE PARTICULARLY EXPEDIENT FOR THE RECOGNITION OF ANEURYSMS OF THE LEFT CARDIAC VENTRICLE. FACILITY: INSTITUT MEDITSINSKOY RADIOLOGII, AMN, SSSR, CENISK.

UNCLASSIFIED

Pharmacology and Toxicology

USSR

UDC 577.153

BOGOLYUBOVA, G. M., KARPINSKAYA, Ye. V., KULIKOVA, A. I., and ROZENGART, V. I.,
Chair of Biochemistry, First Leningrad Medical Institute imeni Academician
I. P. Pavlov

"The Protective Effect of Substrates During Inhibition of Various Cholinesterases by an Organophosphorus Inhibitor"

Moscow, Biokhimiya, Vol 36, No 5, 1971, pp 1,075-1,081

Abstract: The reaction between the organophosphorus inhibitor GD-7 O-ethyl S-ethylmercaptoethyl methylthiophosphonate and three different cholinesterases — horse serum cholinesterase (HSC), bull erythrocyte acetylcholinesterase (BEA), and squid optical ganglion cholinesterase (OGC) — was investigated in the presence of three substrates — acetylcholine (AC), propionylcholine (PC), and butyrylcholine (BC) — in various concentrations. It was found that the rate constant of the reaction of the organophosphorus inhibitor with the enzymes is decreased in the presence of the substrates. A quantitative correlation was established between the reduction in the above rate constant and the concentration of the substrates. OGC is protected by AC more than by PC or BC, while HSC and BEA are protected equally by any one substrate. When BC is present in sufficiently high concentrations, 1/2

BARASHKO, A. S., BOGOMOLOV, A. M., Adaptatsiya, samcoorganizatsiya, Moscow, "Nauka", 1970, pp 14-22

and sufficient condition for diagnosability of an uatomaton is the connection ρ_s, C_n , an algorithm being given for checking the latter condition.

It is shown that the experiment may be analyzed by a monitoring automaton. An estimate is given for the mathematical expectation of a step of the experiment, which leads to determination of a class of partition π . In conclusion, a special case is considered: Recognition of an automaton which belongs to a finite class of automata. A. Maslov.

USSR

UDC 681.3.06:51

BOGOMOLOV, A. M., TVERDOKHOLEBOV, V. A.

"One Approach to Problems of Testing and Diagnosis"

Nadezhnost' Upravlyayushchikh Vychisl. Sistem. Ch. 1, [Reliability of Control Computer Systems, Part 1--Collection of Works], Kiev, 1970, pp 151-158, (Translated from Referativnyy Zhurnal Kibernetika, No 5, 1970, Abstract No. 5V653).

No Abstract.

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1/2 024 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--NEUTRON DIFFRACTION IN LIQUID SODIUM IN THE TEMPERATURE RANGE FROM
THE MELTING POINT TO THE BOILING POINT -U-
AUTHOR--(03)-KRUSHCHEV, B.I., BOGOMOLOV, A.M., IGAMBERDIYEV, SH.KH.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK UZB. SSR. SER. FIZ. MAT. NAUK 1970, 14,1, 80-1

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--NEUTRON DIFFRACTION, LIQUID METAL, SODIUM ALLOY, BOILING
POINT, ALLOY MELTING POINT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1998/1347

STEP NO--UR/0166/70/014/001/0080/0081

CIRC ACCESSION NO--AP0121840

UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0121840

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FROM NEUTRON DIFFRACTION CURVES (WAVELENGTH OF NEUTRONS 1.09 ANGSTROM) AT 100, 300, 500, 700, AND 863 DEGREES THE STRUCTURE OF MOLTEN NA WAS INVESTIGATED. THE COORDINATION NO. OF NA AT 100-500 DEGREES IS CONST. AT 8.8; THE RADIUS OF THE 1ST COORDINATION SPHERE DECREASES FROM 3.85 ANGSTROM AT 100 DEGREES TO 3.65-3.70 ANGSTROM AT 500 DEGREES. FACILITY: INST. YAD. FIZ., TASHKENT, USSR.

UNCLASSIFIED

1/2 017 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--IMPROVEMENT OF DIAGNOSTICITY OF FINITE AUTOMATON BY INTRODUCING
INBUILT CONTROL POINTS -U-
AUTHOR-(02)-BOGOMOLOV, A.M., GRUNSKIY, I.S. *B*

COUNTRY OF INFO--USSR

SOURCE--AVTOMATIKA I TELEMEXHANIKA, 1970, NR 5, PP 183-188

DATE PUBLISHED-----70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR.

TOPIC TAGS--AUTOMATIC CONTROL SYSTEM, AUTOMATON, DATA PROCESSING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAHE--1993/0922

STEP NO--UR/0103/70/000/005/0183/0188

CIRC ACCESSION NO--AP0113757

UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0113757

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ESTIMATIONS OF THE LENGTH OF THE SETTING EXPERIMENT FOR AN AUTOMATON WITH CONTROL POINTS ARE GIVEN A POSSIBLE CHANGE OF THE EXPERIMENT CHARACTER IS INVESTIGATED. THE PROBLEM OF DEFINING THE NECESSARY NUMBER OF CONTROL POINTS IS SOLVED SO THAT THE STATE OF AN AUTOMATON WITH CONTROL POINTS MAY BE RECOGNIZED BY THE REACTIONS ON ANY WORD OF A SET REGULAR EVENT WITH A SET DEGREE OF ACCURACY.

UNCLASSIFIED

USSR

BOGOLYUBOVA, G. M., et al., Biokhimiya, Vol 36, No 5, 1971, pp 1,075-1,081

the organophosphorus inhibitor becomes totally inert, because it cannot interact with butylated cholinesterase. It is believed that the hydrolysis of BC by OGC and HSC is inhibited by the formation of acylated enzymes, while the hydrolysis of AC and PC is inhibited by deacylation.

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USSR

UDC 389.6:620.193.8

BOGOLYUBOVA, Z. S., et al.

Standartizatsiya v oblasti zashchity materialov i izdeliy ot biopovrezhdeniy
(Standardization in the Field of Protection of Materials and Products from
Biological Damage), Moscow, Vniiki, 1972, 96 pp

Translation of Foreword: In storage and use technical products and materials are subjected to the action of various climatic factors (temperature and humidity, air pollution, solar radiation, precipitation), which cause corrosion of metals, alloys, and metallic coverings and aging of plastics, paint, varnish, and other materials. These forms of damage and their mechanisms have to a large degree, been studied; various means and methods of protection have been developed and are widely applied in industry, thus guaranteeing the required longevity of products. Such methods have been developed for testing products, materials and means of protection, permitting evaluation of their resistance to the action of the indicated factors.

However, in addition to corrosion and aging, products and materials in storage and use, in some cases in the production process, are subjected to biological attack caused by the living activity of micro- and macro-organisms, which live in the atmosphere, the soil, and water (in both seas and rivers). As a result specific disintegration and changes occur in the properties of

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USSR

BOGOLYUBOVA, Z. S., Standardization in the Field of Protection of Materials and Products from Biological Damage, Moscow, Vniiki, 1972, 96 pp

materials and the parameters of products, which result in enormous material losses, and can sometimes be the cause of dangerous situations.

The mechanisms of this action are various and depend on organism types, the material which is subjected to attack, and conditions of the surrounding environment.

Until recently it was felt that danger from biological damage to materials and products could arise only in zones of tropical climate. In recent years it has been established that damage due to the action of biological factors also occurs in more temperate climates.

To characterize the loss caused to materials and products by biological actions, the following examples can be presented:

Of the general damage caused to materials and products by climatic factors, 15-25% are the result of biological actions;

According to data of the International Bulletin of Biological Damage the material loss caused by biological actions is about 2% of the value of the produced materials;

English researchers consider that about 80% of the cases of oil well disintegration occur as the result of biological damage;

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USSR

BOGOLYUBOVA, Z. S., Standardization in the Field of Protection of Materials and Products from Biological Damage, Moscow, Vniiki, 1972, 96 pp

More than 50% of the cases of corrosion of underground pipelines are the result of bacterial action;

In the rolling metals, corrosion of sheet aluminum and steel is observed which results from the infection of grease and emulsions by microorganisms;

Airplane fuel tanks and storage tanks for petroleum products are subjected to corrosion caused by the presence of microorganisms in jet fuels;

The loss caused by growths on the underwater parts of vessels reaches more than 200 million dollars a year in the USA, and tens of millions of rubles each year in the Soviet Union.

At the present time there have been established in many countries of the world coordination centers and special laboratories concerned with the problem of the protection of materials and products from biological damage.

Thus, for example, in the Soviet Union work on the protection of materials and products from biological damage began after World War II. In a series of institutes, special laboratories were organized: in 1968, attached to the Academy of Sciences of the USSR, the Scientific Council on Theoretical Problems of Biological Damage to Materials was created; the Coordination Council

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USSR

BOGOLYUROVA, Z. S., Standardization in the Field of Protection of Materials and Products from Biological Damage, Moscow, Vniiki, 1972, 96 pp

for the Study of Termites was organized.

With the International Electrotechnical Commission a special committee for testing materials for fungus resistance was organized; The International Committee on Sea Corrosion and Borers was created, etc. Methods of testing materials and products of various types of bioresistance are being developed by many institutes; means of protection are being developed and patented, research into the mechanism of biological damages is being conducted, etc.

At the present time it is both opportune and necessary to develop a series of government standards, establishing methods of testing various materials and products for bioresistance, which will permit controlling and stabilizing their quality. This will be the first step in the realization of the Decree of the CPSU Central Committee and the Council of Ministers of the USSR of 10 November 1970 "On Increasing the Role of Standards in Improving the Quality of Finished Products" in the field of the protection of materials and products from biological damage.

The authors have studied and summarized domestic and foreign bibliographic and technical standardization materials, as well as the results of the work of scientific research institutes on questions of resistance of various

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USSR

BOGOLYUROVA, Z. S., Standardization in the Field of Protection of Materials and Products from Biological Damage, Moscow, Vniiki, 1972, 96 pp

materials to the action of biological factors, on methods of testing them for bioresistance and protection from biological damages.

The completed work made it possible to adopt a decision on the expediency and possibility of the development of a series of government standards establishing methods of testing them for bioresistance, and also demands for means and methods of protection of materials and products from biological damage.

Assistant to the President, Gosstandard, USSR, A. M. Nikiforenko

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57

Biological Corrosion of Metals

72

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Steels

USSR

UDC 669.15-194.2:669.046.542

ALEKSEYEV, V. I., BOGOLYUBSKIY, S. D., USHAKOV, I. S., and
SHVARTSMAN, L. A., Moscow

"Activity of Carbon in Low-Alloy Steels and Their Tendency to Hydrogen
Corrosion"

Moscow, Izvestiya Akademii Nauk SSSR, Metally, No 1, Jan 71, pp 134-141

Abstract: A circulation method is used to study the equilibrium of H_2-CH_4 mixtures with the carbon in steels. Steels studied included carbon steel, types 15KhM, 30KhMA, and 40Kh, in the 550-900°C temperature interval. The temperature dependence of thermodynamic activity of carbon was determined. In low-alloy steels types 15KhM, 30KhMA, and 40Kh (0.38 wt. %C) at temperatures below the eutectoid, the activity of carbon is significantly less than in Fe-C alloys in the two-phase $\alpha + \text{graphite}$ area. Therefore, graphitization of these steels at these temperatures is impossible. The presence of a correlation between the

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USSR

ALEKSEYEV, V. I., et al., Izvestiya Akademii Nauk SSSR, Metally,
No 1, Jan 71, pp 134-141

activity of carbon and the tendency of steels to hydrogen corrosion
is demonstrated.

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Corrosion

USSR

UDC 620.193.55

ALEKSEYEV, V. I., ARCHAKOV, YU. I., BOGOLYUBSKIY, S. D., and SHVARTSMAN, L. A.

"Incubation Period of Hydrogen Corrosion of Carbon Steel"

Moscow, Zashchita Metallov, Vol 6, No 6, Nov-Dec 70, pp 735-737

Abstract: This article contains the results of a study of the incubation period of hydrogen corrosion of carbon steel. From the data on the variation of the density of steel 45 as a function of the time under the effect of hydrogen and also the distribution of the relative carbon content in U10A steel after holding in hydrogen for 6, 10, and 14 hours it is concluded that the time before the beginning of hydrogen corrosion is 14-21 hours, which agrees satisfactorily with the results calculated by the earlier derived empirical equation. The mechanism of the extremal nature of the change in density $\Delta\rho$ as a function of the holding time in hydrogen is discussed. During a 14-hour period the processes of shrinkage and swelling of the steel develop predominately in the thin surface layer. However, when holding for 21 hours the swelling not only greatly exceeds the contraction but it also extends to a significant depth.

It is concluded that the incubation period of hydrogen corrosion can be subdivided into two steps. In the first step there is surface decarburization

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USSR

ALEKSEYEV, V. I., et al., Zashchita Metallov, Vol 6, No 6, Nov-Dec 70, pp 735-737

and accumulation of methane in the micropores of the steel to pressures leading to small, probably elastic deformation of the matrix. The plastic properties of the steel practically do not change. On reaching the critical pressure, intense growth of the pores begins, controlled, probably, by the laws of elasticity and plasticity and also by the rate of methane accumulation in the micropores. The plastic properties of the steel become worse, and this is considered the second step of the incubation period. As a result of growth and merging of the micropores, microcracks are formed, increasing the hydrogen penetrability of the steel and its contact surface with the hydrogen atmosphere, leading to sharply intensified decarburization. Thus, the swelling of steel 45 after holding in hydrogen at 500° and 100 technical atmospheres up to 14 hours is small, but holding it for 21 hours leads to a significant decrease in density and plasticity. This can be related to reaching the critical methane pressure in the pores during this time, leading to accelerated crack development and decarburization.

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USSR

B
UDC: 620.193.55

ALEKSEYEV, V. I., ~~BOGOLYUBSKIY, S. D.~~, USHAKOV, I. S., and SHVARTSMAN, L. A.,
Central Scientific Research Institute of Ferrous Metallurgy imeni I. P. Bardin

"Thermodynamic Evaluation of the Tendency of Steels to Hydrogen Corrosion"

Moscow, *Zashchita Metallov*, Vol. 6, no. 4, Jul-Aug 70, pp 397-403

Abstract: Forms of hydrogen corrosion, such as cracking along grain boundaries and dehydrogenization, are caused primarily by the interaction of hydrogen with the carbon of the steel to form methane, which produces high pressures in the steel's micropores. Use was made of thermodynamic activities of carbon measured by the circulation method of gas equilibria to calculate equilibrium pressures of methane in the micropores of austenitic chromium-nickel steels Kh25N20S2, 4Kh25N20S2, Kh25N25G6V5MBAR, and Kh18N10T within 700--1000°C. By comparing the strength characteristics of the steels with the methane pressure in the micropores, it is possible to evaluate their tendency to failure. A correlation is noted between hydrogen resistance (found by testing steel in hydrogen) and the carbon activity, making it possible to determine the tendency of steels to hydrogen corrosion without having to resort to protracted and relatively inefficient laboratory tests in hydrogen.

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1/2 020 UNCLASSIFIED PROCESSING DATE--3000:70
TITLE--ELECTRICAL PROPERTIES OF SURFACE BARRIER P-N JUNCTIONS ON HIGH
RESISTANCE CADMIUM TELLURIDE -U-
AUTHOR-(05)-BOGOMAZOV, A.P., KARPENKO, V.P., KASHERININOV, P.G., MATVEYEV,
D.A., STETSYUK, R.S.
COUNTRY OF INFO--USSR
SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(4), 813-14
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS, PHYSICS
TOPIC TAGS--CADMIUM TELLURIDE, ELECTRIC PROPERTY, PN JUNCTION, ELECTRIC
FIELD, VOLT AMPERE CHARACTERISTIC
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1998/0932 STEP NO--UR/0449/70/004/004/0813/0814
CIRC ACCESSION NO--AP0121534
UNCLASSIFIED

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PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0121534

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DARK CURRENT VOLTAGE

CHARACTERISTICS OF SURFACE BARRIER P-N JUNCTIONS ON HIGH RESISTANCE COTE
ARE QUADRATIC AND MORE INFLUENCED BY THE ELEC. FIELD IN THE BASE AREA
THAN BY THE RESISTANCE OF THE JUNCTION ITSELF. THE LATTER BECOMES
IMPORTANT WHEN THE BASE RESISTIVITY IS REDUCED BY ILLUMINATION; IN THIS
CASE, THE CURRENT VOLTAGE CURVE IS EXPONENTIAL. FACILITY: FIZ.
TEKH. INST. IM. IOFFE, LENINGRAD, USSR.

UNCLASSIFIED

USSR

UDC 669.018.4:536.2:621.762.4

SAMSONOV, G. V., BOGOMOL, I. V., L'VOV, S. N., and LESNAYA, M. I., Institute of Problems of Material Science, Academy of Sciences UkrSSR, Institute of Physics of Metals, Academy of Sciences UkrSSR

"Thermal Conductivity of Cermets Containing Titanium Carbide"

Kiev, Poroshkovaya Metallurgiya, No 11 (119), Nov 72, pp 62-65

Abstract: A study was made of the thermal conductivity of cermets of the systems TiC-Nb, TiC-Ta, TiC-Mo, and TiC-W, containing 25, 50, and 75 at% metal, within the 20-1100°C temperature range. The thermal conductivity was measured on hot-pressed specimens according to a previously described method [Porosh Novaya Metallurgiya, No 9, 89, 1966]. Temperature and concentration dependences of thermal conductivity of the cermets are shown. A considerable drop was established for the thermal conductivity coefficient of the cermets in comparison with introduced metals. A relative increase of the thermal conductivity coefficient is shown to take place at a constant temperature in a number of the investigated compositions. Two figures, one table, seven bibliographic references.

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USSR

UDC 669.018.4:537.311.621.762.4

SAMSONOV, G. V., BOGOMOL, I. V., L'VOV, S. N., and LESNAYA, M. I., Institute of Problems of Material Science, Academy of Sciences Ukr SSR and the Kherson Pedagogical Institute

"Electrophysical Properties of TiC-Nb, TiC-Ta, TiC-Mo, and TiC-W Cermets"

Kiev, Poroshkovaya Metallurgiya, No 10, Oct 72, pp 62-67

Abstract: The temperature function of specific electrical resistance ρ and coefficient of thermal emf α of TiC-Nb, TiC-Ta, TiC-Mo, and TiC-W cermets, with a varying content of cementizing metal, was investigated at 20-1100°C. The Hall coefficient R was also measured at room temperature. Cermet samples were made by sintering, plus hot extrusion at 2000-2500°C at a pressure of 300 kg/cm² for 10-15 minutes. Extremes were observed in the concentration relationships at 50 at.% Nb(Ta) and 25 at.% Mo(W). The linear nature of the temperature function $\rho = \rho(t)$, $\alpha = \alpha(t)$ was shown for the investigated cermets, which testifies to the metallic character of their conductivity. The specific electrical resistance of TiC-Nb and TiC-Ta exceeds the resistance of the initial metals (Nb--16 and Ta--14.7 micro-ohm-cm) by 7-14 times and is 2-4 times greater than in TiC (53 micro-ohm-cm). In the TiC-Mo and TiC-W cermets the specific electrical resistance is an order higher than in the initial materials 1/2

USSR

SAMSONOV, G. V., et al., Poroshkovaya Metallurgiya, No 10, Oct 72, pp 62-67
and 1-3 times higher than in TiC, with the exception of compositions 25TiC-
75Mo or 25TiC-75W, where the electrical resistance is somewhat less than in
TiC. 3 figures, 1 table, 12 bibliographic references.

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USSR

UDC 621.762.55:669.018.4

KOVAL'CHENKO, M. S., ~~BOGOMOL I. V.~~ SEREBRYAKOVA, T. I., Institute of Problems of Material Science, Academy of Sciences Ukr SSR

"Studies of Kinetics of Hot Pressing of Alloys of Titanium and Tungsten Carbides Cemented with Niobium"

Kiev, Poroshkovaya Metallurgiya, No 6, Jun 72, pp 15-21.

Abstract: The kinetics of the process of sintering of alloys containing the carbides of titanium and tungsten and cemented with niobium by hot pressing is studied. The influence of the hot pressing parameters (temperature, pressure and holding time) on the density of the cermets is studied to determine the optimal technological modes for production of high density alloys, and also to reveal the regularities of the kinetics of the process of compacting during sintering. The content of the metal component was varied from 25 to 75 at.%. It was found that compacting during sintering of cermets is controlled by processes of unstable creep in the initial stage of hot pressing and of stable creep in later stages. The greatest relative density (0.93-0.97%) was achieved at 2,100-2,375°C under a pressure of 300 kg/cm², time 10-15 minutes.

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USSR

UDC 577.1:615.7/9

BOGOMOLETS, YE. A.

"Reaction of Rat Thyroid to Administration of Ortho-, Para-,
Primdichlorodiphenyldichloroethane"

Farmakol. i toksikologiya. Resp. mezhved. sb. (Pharmacology and
Toxicology. Republic Interdepartmental Collection of Works), 1970,
No 5, pp 130-133 (from RZh-Biologicheskaya Khimiya, No 19, 10 Oct
70, Abstract No 19 F1832)

Translation: The reaction of rat thyroid (I) to administration of
ortho-, para-, primdichlorodiphenyldichloroethane (o,p'-DDD) was
studied. Following the administration of commercial DDD enriched
with the o,p'-isomer, the functional activity of I decreased.
Administration of the pure isomer of o,p'-DDD had no effect on the
function of I. The inhibiting effect of commercial DDD on I func-
tion is related to its systemic toxic influence, a property not
possessed by the purified preparation.

Resume

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- 05 -

Acc. Nr: AP0037234

B

Ref. Code: UR 0301

PRIMARY SOURCE: Voprosy Meditsinskoy Khimii, 1970, Vol 16,
Nr 1, pp 23-29

SEPARATION OF SUBSTRATE AND KININOGENASE ACTIVITIES OF HORSE
BLOOD PLASMA

Kauricheva, N. I.; Kuznetsova, V. M.; Bogomolets-Enrikes, O. M.

N. F. Gamaleya Institute of Microbiology and Epidemiology USSR Academy
of Medical Sciences, Moscow

Horse plasma kininogens and kallikrein were separated by precipitation with polyethylene glycol with mol. wt. 6000 at 6.7% of saturation. 60% of kininogen which releases kinin when incubated with plasma kallikrein and venom enzyme was obtained in the supernatant. Kallikrein was concentrated in the precipitate.

D.H.

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REEL/FRAME
19730159

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USSR

UDC 669.14.018.44:620.192.7

TRUNIN, I. I., KUMANIN, V. I., and BOGOMOL'NAYA, R. B., Central Scientific Research Institute of Technology and Machine Building, All-Union Correspondence Machine Building Institute

"Destruction Mechanism of Heat-Resistant Steel"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 10, 1972, pp 46-50

Abstract: The destruction mechanism of EP44 steel (0.22% C, 1.45% Cr, 1.03% Mo, 0.9% V, 0.15% Nb, 0.15% Ni, 0.0026% B, and 0.06% Ce) was studied during a tensile test using samples with different plasticity indicators. Samples (I) were normalized at 1100°C for 30 min and tempered at 725°C for 6 hr. Samples with high plasticity (II) were hardened in oil at 1050°C for 1 hr and tempered at 725°C for 6 hr. The metallographic analysis of deformed (broken during the tensile test) samples showed that accumulation of a critical number of micropores leads to destruction of the EP44 steel. Pores in both type of samples were localized along the grain boundaries perpendicular to the tensile axis. Most of the pores were concentrated close to the breaking point of the samples. The total volume of pores at this point was approximately 0.41-0.51% regardless of the test duration.

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USSR

TRUNIN, I. I., et al., Metallovedeniye i Termicheskaya Obrabotka Metallov, No 10, 1972, pp 46-50

At a distance of 5 mm from the breaking point the total volume of pores decreased 3-5 times, and 10-100 times at a distance of 10 mm. The micro-hardness of samples I decreased upon approaching the breaking point, but for samples II it was independent of the distance from the breaking point. The metal density at the breaking point was identical for both types of samples, and was equal to 0.006-0.01 g/cm³.

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USSR

UDC 539.3

STEPANOV, R. D., Professor, Doctor of Technical Sciences, and BOGOMOL'NIY, V.M., Aspirant, Moscow Institute of Chemical Machine Building

"The Calculation of Multilayer Toroidal Shells"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy--Mashinostroyeniye, No 10, 1973, pp 5-9

Abstract: Consideration is given to the stress-deformed state of multilayer toroidal shells, specifically of a two-layer toroidal segment, in the presence of a deflecting load and internal pressure. This is the type of annular membranes, welded along the internal contour and the external contour, from which bellows of the "membrane" type are constructed. The results of calculation of the two-layer membrane are compared with experimental results. It is shown that the multilayer effect, consisting of a decrease of flexural rigidity, is manifested in the case of a number of layers not in excess of two or three. 3 figures. 2 references.

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USSR

BOGOMOL'NYY, YE. B., DOLGOV, A. D., ZAKHAROV, V. I., OKUN', L. B.,
SHIFMAN, M. A., SHMATIKOV, M. ZH., Institute of Theoretical and Experimental Physics of the State Committee for the Use of Atomic Energy

" $K_L^0 \rightarrow \mu^+ \mu^-$ and the Anomalous Interaction of Muons With Hadrons"

Moscow, Yadernaya Fizika, Vol. 16, No. 1, Jul 72, pp 129-142

Abstract: The possible contribution of the 3π -intermediate state in the imaginary part of the amplitude of $K_L^0 \rightarrow \mu^+ \mu^-$ decay and the possibility of the existence of anomalous muon-pion interaction which could balance the imaginary part of the amplitude of $K_L^0 \rightarrow \mu^+ \mu^-$ decay arising through the 2γ -intermediate state are discussed. It is noted that the existence of an anomalously strong pion-muon interaction could resolve the contradiction between the experimental results of Clark, Field, et al and the theory, but it is shown that the anomalous interactions $\pi^0 \rightarrow 2\mu$ and $3\pi \rightarrow 2\mu$ do not contradict existing experimental data on elastic and inelastic scattering of a muon by a nucleon, on the generation of muon pairs by pions, and by data on $(g - 2)$ for the muon. It is noted that in this approach series difficulties arise which are associated with the very large value of $\text{Re } H_{KL}^{(3\pi)} \rightarrow 1/2$

USSR

BOGOMOL'NIY, YE. B., et al., Yadernaya Fizika, Vol 16, No 1, Jul 72, pp 129-142

→ 2μ and with the necessity for compensating for it with a high degree of accuracy. Experimental observation of the anomalous muon-pion interaction was complicated by two circumstances: the smallness of the anomalous cross section ($\sim 10^{-34} \text{ cm}^2$) and the large value of the cross sections for background processes which exceed the anomalous processes by a factor of 10-1000. Elastic backscattering of the μ -meson by a proton at an energy of $\sim 1 \text{ GeV}$, measurement of $(g - 2)$ of the μ -meson, and a study of the $\mu p \rightarrow \mu p \pi^0$ process at $E_\mu \geq 10 \text{ GeV}$ are recommended as the most sensitive methods for observing this interaction. It is proposed that $\text{Im} H_{K \rightarrow 2\mu}^{(2\gamma)}$ is compensated not by the contribution of the 3π -intermediate state but by the contribution of other intermediate states arising in $K_L^0 \rightarrow \mu^+ \mu^-$ decay, such as $2\pi\gamma$. A discussion of the consequences of possible $2\pi\gamma - 2\mu$ -anomalous interaction will be the subject of a later paper.

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USSR

BOGOMOL'NIY, YE. B., DOLGOV, A. D., ZAKHAROV, V. I., OKUN', L. B., and
TERENT'YEV, M. V., Institute of Theoretical and Experimental Physics, State
Committee on the Use of Atomic Energy

"On Possible Effects of CPT-Invariance Violation and $K_L \rightarrow 2\mu$ Decay"

Moscow, Yadernaya Fizika, Vol 15, No 5, May 72, pp 985-994

Abstract: An earlier article by the authors noted that the experimental data
of A. L. CLARK, T. ELIOTT, R. C. FIELD et al. on $K_L \rightarrow 2\mu$ decay can be fitted
to unitarity if it is assumed that there is a CPT-noninvariant interaction
which makes a contribution to the $K_L \rightarrow 2\mu$ decay amplitude in the form

$$ibK_2\bar{\mu}\gamma_5\mu \quad (1)$$

and partly compensates for the contribution of the two-photon intermediate

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USSR

BOGOMOL'NIY, YE. B., et al., Yadernaya Fizika, Vol 15, No 5, May 72, pp 985-994

state to the absorptive CPT-invariant part of the amplitude. If the absorptive part, which results from other real transitions, is ignored, there is no conflict with the CLARK et al. experiment if $b \simeq 0.5a \simeq 10^{-12}$. The present article gives a detailed discussion of properties of such an interaction and experimentally observed effects in which it might appear. Properties of the K_L^0, K_S^0 system are considered, followed by a discussion of possible leptonic decays of K mesons with the participation of neutral currents and charged currents, nonleptonic decays, radiative decays, and muon decays.

The authors thank V. N. GRIBOV, B. L. IOFFE, and I. YU. KOBZAREV for interesting discussions.

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USSR

UDC 537.226.33

RUDYAK, V. M., BOGOMOLOV, A. A., and IVANOV, V. V.

"The Influence of Illumination on the Processes of Polarization Reversal of SbSI Single Crystals"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, Vol 35, No 9, Sep 71, pp 1897-1899

Abstract: It has been shown many times in the past that the illumination of SbSI single crystals produces a change in the amount of polarization and an acceleration in the process of establishing polarization. It has also been seen that the effect from the action of light depends greatly on the interval of time which divides the electric field commutation from the moment of supplying the light impulse. This paper is concerned with a more detailed investigation of the dependence of the influence of illumination on the processes of reversing SbSI as a function of the time interval. The authors use both methods employed earlier and the method of fixing the point of reversal, thus allowing them to directly observe the kinetics of rearranging the domain structure and to fix the change in the entire polarization. They

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USSR

RUDYAK, V. M., Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, Vol 35, No 9, Sep 71, pp 1897-1899

find and graphically confirm that light influences the processes of reversal only when the polarization is found to be in an unbalanced state. When the polarization becomes balanced, there is no manifestation from the light effect within the sensitivity range of the equipment employed. The article contains 3 illustrations and 9 bibliographic entries.

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USSR

UDC 62-50

BOGOMOLOV, A. I.

"Roughness of the Solution of the Statistical Problem of Analytical Design of Regulators"

Tr. Kazan. aviats. in-ta (Works of the Kazan' Aircraft Institute), 1971, vyp. 130, pp 42-50 (from RZh-Mekhanika, No 11, Nov 71, Abstract No 11A177)

Translation: A study was made of the problem of implementing the optimal control law. It is pointed out that one of the causes of deviation of the real control process from optimal is dynamic errors when calculating the phase coordinates entering into the optimal control law which are inaccessible to observation. If in the case of small dynamic errors the quality index of the system is close to optimal, that is, if the system is rough in the sense of A. A. Andronov, then implementation of the optimal control law found is possible. Thus, when solving the problem of optimal control it is necessary to check the system for roughness. For a stationary linear system

$$x_i = \sum_{j=1}^n a_{ij} x_j + \sum_{q=1}^r b_{iq} u_q \quad (i = 1, \dots, n)$$

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USSR

UDC 519.1

BOGOMOLOV, A. M., BARASHKO, A. S., and GRUNSKIY, I. S.

"Experiments with Automata"

Kiev, Eksperimenty a avtomatami (cf. English above), "Nauk. dumka", 1973, 144 pp, 111. 92 k. (from RZh-Matematika, No 9, Sep 73, Abstract No 9V437 K from the foreword)

Ytranslation: The book presents results recently obtained by the authors relating to only a few sections of the theory of experiments with automata. Every chapter in the book can be read independently of the others.

The introduction presents the fundamental concepts of the theory of experiments with automata and gives a survey of the principal results in this field which imparts a general idea of the current state of this theory.

The first chapter investigates control experiments done to determine whether an automaton is in working order. A class of procedures is distinguished for construction of experiments with shorter estimates of length than the control experiments investigated by Hennie, Keim and Gonenz.

The second chapter formalizes the rules for drawing conclusions based on the results of unconditional and conditional experiments on recognizing automata of a certain class, and it investigates the stability of adjustment sequences.

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• USSR

BOGOMOLOV, A. M., et al., *El'sperimenty s avtomatami*, "Nauk. dumka", 1973

The third chapter investigates the properties of partial tests used in recognizing automata of a certain class and suggests a method of directed search for partial tests. The fourth chapter studies the possibility of using so-called probabilistic experiments for checking and diagnosing automata where the input sequence is given by a source of random signals with assigned properties rather than by the experimenter.

The fifth chapter examines questions of checking and diagnosing networks of automata and presents a solution for the problem of determining which component of a network has malfunctioned by measurements at the input and output of the network.

The sixth chapter studies methods of transformation of arbitrary automata, which can be interpreted as isolating control points to ensure a given level of control and diagnosis.

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USSR

BOGOMOLOV, A. M., BARASHKO, A. S. and GRUNSKIY, I. S.

"Experiments with Automata"

Ekspierimenty s Avtomatami [English version above], Kiev, Nauk. Dumka Press, 1973, 144 pp (Translated from Referativnyy Zhurnal Kibernetika, No 9, 1973, Abstract No 9V437)

Translation: This book presents results produced by the authors recently and related only to certain sections of the theory of experiments with automata. Each of the chapters of the book can be read independently of the other chapters.

The introduction presents the basic concepts from the theory of experiments with automata and reviews the basic results in this area, allowing a general idea to be gained of the contemporary status of this theory.

The first chapter is dedicated to the study of control experiments performed in order to determine the correctness of functioning of an automaton. A class of procedures for construction of experiments with shorter estimates of length than the control experiments studied by Khenni, Kaym and Gonents is differentiated.

In the second chapter, the rules for drawing of conclusions based on the results of unconditional and conditional experiments on the recognition of automata of a known class are formalized and the stability of setting sequences is studied.

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USSR

BOGOMOLOV, A. M., BARASHKO, A. S. and GRUNSKIY, I. S., Eksperimenty s Avtomatami, Kiev, Nauk. Dumka press, 1973, 144 pp

Chapter Three studies properties of partial tests used in the recognition of automata of a known class and suggests a method for directed search for partial tests. The fourth chapter is dedicated to the study of the possibility of the use of so-called probability experiments for the testing and diagnoses of an automaton, during which the input sequence is fixed not by the experimenter, but rather by a random signal source with predetermined properties.

Chapter Five studies problems of testing and diagnoses of networks of automata and solves the problem of the determination of the defective component of a network by measurements at the input and output of the network.

Chapter Six is dedicated to the study of methods of conversion of arbitrary automata, which can be interpreted as differentiation of test points for provision of a fixed level of testing and diagnoses.

From the forward

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USSR

UDC 577.4

BOGOMOLOV, A. M., TVERDOKHILEBOV, V. A.

"Results of Studying the Problems of Test Diagnosis of Complex Systems"

V sb. Tekhn. diagnostika (Technical Diagnostics -- collection of works), Moscow, Nauka Press, 1972, pp 256-260 (from RZh-Kibernetika, No 7, Jul 72, Abstract No 7V417)

No abstract

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USSR

UDC: 51:621.391

BOGOMOLOV, A. M., TVERDOKHLEBOV, V. A.

"Nemurovskiy Experiments With Complex Systems"

V sb. Obnaruzh. i raspoznavaniye. Planir. eksperimentov (Detection and Recognition. Planning of Experiments--collection of works), Moscow, "Nauka", 1970, pp 92-98 (from RZh-Kibernetika, No 1, Abstract No 1V335)

Translation: As the authors point out, in analyzing "complex systems" the effect of input sequences alone on the system may be insufficient for producing the desired output. Sometimes in the process of the experiment it is advisable to utilize effects on the system being investigated such as changing the system to some state with the aid of a built-in device, changing the working conditions of the system, leading to a change in the transfer and output functions of the abstract automaton which describes the system, etc. These ideas and some others are formulated in the paper, and problems are also outlined which are involved in the given class of questions. G. Blokhina.

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USSR

UDC: 51:621.3

BARASHKO, A. S., BOGOMOLOV, A. M.

"Probabilistic Experiments With an Automaton"

V sb. Adaptatsiya, samoorganizatsiya (Adaptation, Self-Organization--collection of works), Moscow, "Nauka", 1970, pp 14-21 (from RZh-Kibernetika, No 1, Jan 71, Abstract No 1V363)

Translation: The process of observing the input and output sequences of an automaton which has a source of random signals at the input, and analyzing the resultant data, is called a probabilistic experiment. Let us consider the automaton $A = (S, X, Y, \delta, \lambda, S_0)$, where S is the set of states, X is the alphabet of inputs, Y is the alphabet of outputs, δ is the transformation function, and λ is the sign function. Let the partition π be given on the set of initial states S_0 , and let ϵ_π be the corresponding relationship of equivalence on S_0 . Let us use the notation $P(x|p)$ to designate the probability that the symbol x will appear at the input of the automaton following the word $p \in X^*$. We shall assume that for some $\epsilon > 0 \forall x \forall p (P(x|p) > \epsilon)$. If it may be determined with probability one during the course of the experiment, to which class of π the initial state belongs, then the automaton is said to be diagnosable. Let us give the relationship $\rho: (s, i) \in \rho \Leftrightarrow (\exists p \in X^*) (\delta(i, p) = s \wedge \lambda(i, p) \in \pi)$. And let $\rho_{S_0} = \rho \cap S_0 \times S_0$. It is proved that a necessary

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Measuring, Testing, Calibrating

USSR

UDC 621.384.6.01

BOGOMOLOV, A. S., ZAKUTOV, YE. M., and SHEBOLAYEV, I. V., Institute of Chemical Kinetics and Combustion, Siberian Department of the Academy of Sciences, USSR, Novosibirsk

"An Analyzer for the Energy and Phase Distribution of Electrons in a Beam"

Moscow, Priroda i Tekhnika Eksperimenta, No 3, May-June 1973, pp 27-30

Abstract: A description is given of the design and operation of an analyzer of the phase and energy current-density distributions of the particles in electron guns. The deflecting system consists of two identical cylindrical resonators, called a double resonator. The relative position of the cavities of the double resonator, and their common position with respect to the beam under investigation, is so chosen that at a specific phase shift among the oscillations in the cavities, the double resonator produces circular scanning of the beam on the plane of electron registration, for example on a fluorescent screen. A characteristic feature of the double resonator consists in the fact that two types of fields are used for deflection of the electrons -- a transverse magnetic field in relation to the beam, and an electrical one that is longitudinal with respect to the beam; this permits the conduct of precise measurements of electron distribution with respect to the energies in various phase sections of the

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USSR

BOGOMOLOV, A. S., et al., Priory i Tekhnika Eksperimenta, No 3, May-June 1973,
pp 27-30

beam. The analyzer is applicable to electron beams with an energy from 10 to
3000 kev. 3 figures. 2 references.

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- 129 -

USSR

UDC 621.762.01:669.295'787'784

BOGOMOLOV, G. D., and SHVEYKIN, G. P.

"Conditions for Producing Compact Specimens of Titanium Hydroxycarbide"

Tr. In-ta khimii. Ural'sk. nauch. tsentr. AN SSSR (Works of the Chemistry Institute of the Ural Scientific Center of the Academy of Sciences USSR), 1971, vyp. 23, pp 56-61 (from RZh-Metallurgiya, No 1, Jan 72, Abstract No IG264 by S. Krivonosova)

Translation of Abstract: The article considers the conditions for producing compact specimens of Ti hydroxycarbide according to composition and powder grain size during sintering at 1500-1600° in vacuum, as well as during hot pressing. Porosity of sintered specimens increases with the growth of x in TiC_xO_y and particle size of the initial charge. A reliable method for obtaining nonporous specimens is hot pressing. One table. Bibliography with three titles.

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USSR

UDC 546.821'21'26

BOGOMOLOV, G. D., LYUBIMOV, V. D., SHVEYKIN, G. P., and ALYAMOVSKIY, S. I. Institute of Chemistry, Ural Branch of the Academy of Sciences USSR

"Physicochemical Properties of Titanium Oxycarbides"

Moscow, Neorganicheskiye Materialy, Vol 6, No 11, Nov 70, pp 1961-1963

Abstract: A study was made of the stability of a series of TiC_xO_y preparations toward acids, and alkalies, and also to air oxidation. Ti, C_{bound}, C_{free}, and N₂ levels were determined in preparations made by vacuum sintering of mixtures of starting oxide $TiO_{1.03}$ and carbide $TiC_{0.84}$ to form tablets 10 x 10 mm in size. TiC_xO_y preparations were found to be stable toward concentrated and dilute HCl and H₂SO₄, both at room temperature and at elevated temperatures. The oxycarbide $TiC_{0.57}O_{0.44}$ proved to be most acid-resistant of the hot-pressed samples. The oxycarbide $TiC_{0.57}O_{0.44}$ showed the greatest resistance to air oxidation at 950, 1100, and 1250° C.

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1/2 013
UNCLASSIFIED
TITLE--NEUTRON DIFFRACTION STUDY OF THE STRUCTURE OF TITANIUM OXYCARBIDES
-U-
AUTHOR--(05)-ZUBKOV, V.G., MATVEYENKO, I.I., DUBROVSKAYA, L.B., BOGCMOLOV,
G.D., GELD, P.V.
COUNTRY/OF INFO--USSR
SOURCE--DOKL. AKAD. NAUK. SSSR 1970, 191(2), 323-5
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--TITANIUM CARBIDE, NEUTRON DIFFRACTION, ELECTRIC RESISTANCE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1995/1114
STEP NO--UR/0020/70/191/002/0323/0325
CIRC ACCESSION NO--AT0116580
UNCLASSIFIED

2/2 013

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AT0116580

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ELEC. RESISTANCE WAS MEASURED AT 298DEGREESK FOR A SERIES OF SAMPLES OF TIC SUBX 0 SUBY (X PLUS Y EQUALS 1), AND TIC SUB0.44 0 SUB0.57 WAS STUDIED BY NEUTRON DIFFRACTION. THE SAMPLES WERE PREPD. BY A METHOD DESCRIBED EARLIER (L. PIVOVAROV ET AL., 1967). THE CONC. DEPENDENCE OF THE RESISTANCE IS CHARACTERISTIC FOR ORDERED SYSTEMS, AND THIS WAS SUPPORTED BY THE NEUTRON DIFFRACTION DATA. THE O AND C ATOMS ARE IN AN ORDERED POSITION IN THE NONMETALLIC SUBLATTICE. FOR COMPNS. THAT ARE NOT EQUI AT., THE ATOMS OF THE EXCESS COMPONENT OCCUPY UNIQUE POSITIONS IN THE STATISTICALLY VACANT POSITIONS FOR THE DEFICIENT COMPONENT. FACILITY: INST. KHIM., SVERDLOVSK, USSR.

UNCLASSIFIED

USSR

UDC 621.385.633

B
BOGOMOLOV, G. D., BORODKIN, A. I., KUSHCH, V. S., LEVIN, G. YA., RUSEN, F. S.,
CHURILOVA, S. A.

"Investigation of the Excitation System of the 'Comb' Type in an Orotron Regime
and a Backward-Wave Tube Regime"

Elektron. tekhnika. Nauchno-tekhn. sb. Elektron. SVCh (Electronic Technology.
Scientific-Technical Collection. Microwave Electronics), 1970, No 1, pp 97-102
(from RZh--Elektronika i yeye primeneniye, No 7, July 1970, Abstract No 7A141)

Translation: An experimental comparison is made between the work of an orotron [microwave oscillator with oscillatory system in the form of an open resonator--Transl.] and a backward-wave tube. The comparison was accomplished on a model of a millimeter band oscillator in which backward-wave tube and orotron oscillations were excited. The dispersion and control characteristics of both forms of oscillations were investigated and also the levels of the power being generated were compared. The stability of both forms of collector [K] is evaluated. 9 ref. Summary.

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USSR

UDC 621.01

BOGOMOLOV, G. I., Candidate of Technical Sciences, Docent

"Variation Problem of the Shape of the Minimum Drag Body for Given Length and Area of a Wettable Surface"

Moscow, Izvestiya vysshikh uchebnykh zavedeniy -- Mashinostroyeniye, No 7, 1971, pp 81-84

Abstract: The variation problem of determining the shape of the minimum drag body (of elliptic cross section) is solved for hypersonic velocities and zero angle of attack if the length of the body and the area of its wettable surface are given. The problem is solved under the assumption that the pressure on the body is subject to Newton's law, and in the given special case of a solid of rotation, previously derived relations [A. Mealy, Teoriya optimal'nykh aerodinamicheskikh form (Theory of Optimal Aerodynamic Shapes), Mir Press, Moscow, 1969] were used. The general equations of the extremal in parametric form where y' is the parameter of the desired outline are derived in the following form:

$$y \ x_j = y(0) \left[\frac{\phi_1 + \left(\frac{\alpha A_1 - 2}{1 - \alpha B_1} \right) \phi_1}{\phi + \left(\frac{\alpha A_1 - 2}{1 - \alpha B_1} \right) \phi} \right],$$

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USSR

BOGOMOLOV, G. I., Izvestiya vysshikh uchebnykh zavedeniy -- Mashinostroyeniye,
No 7, 1971, pp 81-84

$$x = \int_{y(0)}^{y(x)} \frac{dy}{y'}$$

A graph calculated by the derived equations shows that for given length and area of the wettable surface, the minimum drag body has blunt nose since in this case the high pressures are realized on a relatively small area with high inclination near the nose and low pressures on a relatively large area with small inclinations near the given section.

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USSR

UDC 771.531.37:778.33

BOGOMOLOV, K. S., DONSKAYA, S. A., All-Union State Scientific Research and Design Institute of the Photographic Chemical Industry, Shostkinskiy Affiliate

"Effect of Silver Iodide on the Properties of Coarse-Grained X-Ray Emulsions"

Moscow, Zhurnal Nauchnoy i Prikladnoy Fotografii i Kinematografii, Vol 18, No 3, May/Jun 73, pp 161-162

Abstract: Experimental data are given from an investigation of the influence of silver iodide on the photographic and granulometric properties of coarse-grained x-ray emulsions. The emulsions were exposed on the RUP-200 x-ray camera and processed in three different developers: x-ray (total), surface, and subsurface (Stevens). It was found that: 1) x-ray sensitivity is independent of the silver iodide concentration for given constant emulsion grain sizes; 2) the latent image formed in emulsions containing iodide is mainly a subsurface image which is poorly developed by a developer of the surface type.

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USSR

UDC 621.912-492.2

BEZYKORNOV, A. I., BOGOMOLOV, N. I., GURINCHUK, I. I., KOVAL'CHENKO, M. S., KONOVALOVA, Ye. S., and PADERNO, Yu. B., Institute of Problems of Material Science, Academy of Sciences Ukr SSR

"Investigation of the Form, Durability, and Abrasive Ability of Grains of Refractory Compound Powders"

Kiev, Poroshkovaya metallurgiya, No 5, May 71, pp 65-69

Abstract: The results are presented of an investigation of the form, strength, and abrasive properties of powders of fused titanium and niobium carbides and calcium boride, in comparison with certain data on synthetic corundum. The results show that the deviation from grain isometricity of niobium carbide is larger than that of titanium carbide; that the strength of niobium and titanium carbides with a grain size of more than 250 μ is higher than that of calcium boride and white synthetic corundum grains, while at smaller grain sizes the opposite is true. The compounds considered here may be ordered with respect to their increasing abrasive power, beginning with synthetic corundum: EB-NbC-TiC-CaB₆ = 1-1.18 - 1.36 - 1.88.

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USSR

UDC 539.538.669.018.45

BEZYKORNOV, A. I., BOGOMOLOV, N. I., and KOVAL'CHENKO, M. S., Institute of Problems of Material Sciences, Academy of Sciences UkrSSR

"Investigation of the Wear Resistance of Refractory Compounds During Continuous Microcutting of Titanium and Nickel"

Kiev, Poroshkovaya Metallurgiya, No 11, Nov 70, pp 77-83

Abstract: A study is made of the wear resistance of a number of refractory compounds during continuous microcutting of titanium and nickel under conditions of facing. It is established that wear resistance during high-speed cutting depends to a great extent on the degree of physico-chemical interaction of contact pairs, and at low speeds is basically determined by their mechanical properties. The experiments were carried out on a 1K62 lathe. Continuous microcutting speed was 0.2 to 34.4 m/sec, the pressure on the microcutting tool was 0.2 kg and longitudinal feed was 0.07 mm/revolution. Hafnium and tungsten carbides possess the highest wear resistance and refractoriness during microcutting of titanium, while during the microcutting of nickel and iron, aluminum oxide and tungsten carbide display the best wear resistance.

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Refractory Materials

USSR

UDC 669.018.25

BEZYKORNOV, A. I., BOGOMOLOV, N. I., and KOVAL'CHENKO, M. S., Institute of Problems of Material Science, Academy of Sciences Ukrainian SSR

"Study of the Cutting Properties of Refractory Compounds in Intermittent Microcutting of Titanium and Nickel

Kiev, Poroshkovaya Metallurgiya, No. 10, Oct 70, pp 66-72

Abstract: Data are presented on the wear of certain refractory compounds in intermittent cutting of metals having different properties, namely titanium and nickel under conditions similar to those for polishing. The microcutting was performed on a 3G71 surface grinder at a cutting rate of 35 m/sec. The heat release in the cutting zone and the emerging temperature gradient from the cutting zone toward both the cutting material and the material being machined appears to cause high thermal stresses and brittle cleavage of individual grain sections. In addition to brittle failure, which to some extent causes grain wear, there appears to be a

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BEZYKORNOV, A. I., et al, Poroshkovaya Metallurgiya, No. 10, Oct 70,
pp 66-72

physicochemical interaction between both materials. The refractory compounds which interact to a lesser extent with the metal being machined show better wear properties at higher cutting rates. In microcutting titanium, metal-like refractory compounds exhibit higher wear resistance than does aluminum oxide. Some of these refractory compounds compare to silicon carbide. In microcutting nickel and iron, the best results were shown by aluminum oxide.

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1/2 045 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--STUDY OF THE WEAR OF THE ABRASIVE DURING FINE GRINDING -U-
AUTHOR-(03)-BOGOMOLOV, N.I., SAIUTIN, G.I., KHARCHENKO, I.V.
COUNTRY OF INFO--USSR **B**
SOURCE--FIZIKO-KHIMICHESKAIA MEKHANIKA MATERIALOV, VOL. 6, NO. 2, 1970, P.
116-118
DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--AVIATION INSTITUTE, ZIRCONIUM CARBIDE, FRICTION, TITANIUM
ALLOY, SILICON CARBIDE, WEAR RESISTANCE, ALLOY DESIGNATION, ABRASIVE
MINERAL, METAL GRINDING/(U)A12O3 ABRASIVE, (U)W2B5 ABRASIVE, (U)VT8
TITANIUM ALLOY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3001/0090

STEP NO--UR/0369/70/006/002/0116/0118

CIRC ACCESSION NO--AP0125920

UNCLASSIFIED

2/2 045

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0125920

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF THE WEAR OF ABRASIVES INCLUDING SIC, A12O3, W2B5, AND ZRC DURING FINE GRINDING OF ARMCO IRON, TITANIUM, AND TITANIUM ALLOY VT8. IT IS SHOWN THAT UNDER FINE GRINDING CONDITIONS, THE EFFECT OF CHEMICAL COMPOSITION OF THE GROUND MATERIAL ON THE WEAR INTENSITY OF ABRASIVES IS MUCH MORE PRONOUNCED THAN AT EXTERNAL FRICTION OF ABRASIVES ON METAL. FACILITY: KIEVSKII INSTITUT INZHENEROV GRAZHDANSKOI AVIATSII, KIEV, UKRAINIAN SSR.

UNCLASSIFIED

U.S.S.R.

B

U.S.S.R. 587.711.301.6-1.00

MURAVYOVA, K.K., KULENIN, I.P., SARGSYOVA, L.A., ANDREYEV, V.P., and LIL'KOV, N.S., Leningrad Technological Institute imeni Lenzovet, Leningrad, Ministry of Higher and Secondary Specialized Education RSFSR

"Investigation of Growth and Structure of Single Crystalline Films of Cadmium and Zinc Chalcogenides"

Moscow, Neorganicheskiye Materialy, Vol 6, No 3, 1970, pp 434-440

Abstract: The method of condensation in a vacuum of 10^{-4} - 10^{-5} mm Hg is used to grow single crystalline cadmium and zinc chalcogenide films on mica (muscovite), germanium (n- and p-types), GaAs (n- and -p-types) and CdS. It is demonstrated that with an epitaxial temperature of 250-300°C, there is a dependence between the molecular weight of the chalcogenides and the difference between the temperatures of evaporator and substrate. The single crystalline film production conditions depend little on the nature of the substrates investigated. The phase composition of the films produced depends on the epitaxial temperature, condensation rate, type of orienting substrates and evaporator design. Single crystalline films of CdSe of perfected structure with carrier mobility up to $180 \text{ cm}^2/\text{v-sec}$ were grown in a closed crucible under near-isothermal conditions.

1/1

172 030 UNCLASSIFIED PROCESSING DATE 0706770
TITLE--GROWTH AND STRUCTURE OF SINGLE CRYSTAL FILMS OF CADMIUM AND ZINC
CHALCOGENIDES -U-
AUTHOR-(05)-MURAVYEVA, K.K., KALINKIN, I.P., SERGEYEVA, L.A., ALESKOVSKIY,
V.B., BUGOMOLOV, N.S.
COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, NEORG. MATER. 1970, 6(3), 434-40

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--MICA, CADMIUM, ZINC, SINGLE CRYSTAL FILM, VAPORIZATION,
THERMAL EFFECT, MOLECULAR WEIGHT, SINGLE CRYSTAL GROWTH

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1994/1898

STEP NO--UR/0363/70/006/003/0434/0440

CIRC ACCESSION NO--AP0115717

UNCLASSIFIED

2/2 030

UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC # ACCESSION NO--AP0115717

ABSTRACT/EXTRACT--(U) CP-0- ABSTRACT. BY CONDENSATION AT 10 PRIME
NEGATIVE4 MINUS 10 PRIME NEGATIVE5 MM HG, SINGLE CRYSTAL FILMS OF CD AND
ZN CHALCOGENIDES ON MICA (MUSCOVITE), GE (N AND P TYPE), GAAS (N AND P
TYPE), AND CDS WERE STUDIED. AT AN EPITAXIAL TEMP. OF 250-300DEGREES
THERE EXISTS A RELATION BETWEEN THE MOL. WT. OF THE CHALCOGENIDES AND
THE DIFFERENCE BETWEEN THE TEMPS. OF THE VAPORIZER AND THE SUBSTRATE.
THE CONDITIONS OF THE PREPN. OF SINGLE CRYSTAL FILMS DEPEND BUT HEARLY
ON THE NATURE OF THE INVESTIGATED SUBSTRATES. THE PHASE COMPN. OF THE
FILMS PREPD. DEPENDS ON EPITAXIAL TEMP., CONDENSATION RATE, NATURE OF
THE ORIENTING SUBSTRATES, AND CONSTRUCTION OF THE VAPORIZER.
FACILITY: LENINGRAD. TEKHNOL. INST. IM. LENSOVETA, LENINGRAD, USSR.

UNCLASSIFIED

12 027 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--GROWTH AND STRUCTURE OF MONOKRISTALLINE FILMS OF A PRIMEII B
PRIMEVI COMPOUNDS -U-
AUTHOR--(05)-KALINKIN, I.P., MURAVYEVA, K.K., SERGEYEW, L.A., ALESKOWSKY,
V.B., BOGOMOLOV, N.S.
COUNTRY OF INFO--USSR

SOURCE--KRISTALL UND TECHNIK, 1970, VOL 5, NR 1, PP 51-59

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS, MATERIALS

SUBJECT TAGS--SINGLE CRYSTAL FILM, SELENIDE, TELLURIDE, ZINC COMPOUND,
CADMIUM SULFIDE, GERMANIUM, GALLIUM ARSENIDE, CHALCOGENIDE GLASS,
EPITAXIAL GROWTH, SURFACE FILM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

COXY REEL/FRAME--1998/0417

STEP NO--GE/0109/70/005/001/0051/0059

ARC ACCESSION NO--AP0121091

UNCLASSIFIED

1/2-027

UNCLASSIFIED

PROCESSING DATE--23OCT70

RC ACCESSION NO--AP0121091

STRACT/EXTRACT--(U) GP-0- ABSTRACT. IN VACUUM 10 PRIME NEGATIVE4-10
PRIME NEGATIVE5 TORR MONOCRYSTALLINE THIN LAYERS OF CDS, CDSE, CDTE,
ZNS, ZNSE, ZNTE WERE PREPARED ON MICA, (111) SURFACES OF GERMANIUM AND
GALLIUM ARSENIDE SINGLE CRYSTALS AND (0001) AND 1120) CADMIUM SULPHIDE
SURFACES. THE FILM STRUCTURES AND SOME OF THEIR PROPERTIES
(CONDUCTIVITY, N OR P MOBILITIES) WERE SHOWN TO DEPEND ON TEMPERATURE
CONDITIONS OF FILM PREPARATION. IT WAS SHOWN EXPERIMENTALLY THAT IN THE
CASE OF MONOCRYSTALLINE THIN FILMS OF ZINC AND CADMIUM CHALCOGENIDES
THERE IS A CORRELATION BETWEEN EVAPORATION AND EPITAXY TEMPERATURES OF
FILM PREPARATION. STRUCTURE AND PHASE COMPOSITION OF MONOCRYSTALLINE
LAYERS ARE CONNECTED WITH THE NATURE OF SUBSTRATE SUBSTANCES USED
(INCLUDING POLARITY OF (111) DIRECTION IN GALLIUM ARSENIDE AND (0001)
DIRECTION IN CADMIUM SULPHIDE). FACILITY: INSTITUTE OF
TECHNOLOGY LENSOVIETA, LENINGRAD.

UNCLASSIFIED

1/2 020

UNCLASSIFIED

PROCESSING DATE--13NOV70

TITLE--GROWTH AND ELECTROPHYSICAL PROPERTIES OF SINGLE CRYSTAL FILMS OF
CADMIUM AND ZINC CHALCOGENIDES -U-

AUTHOR--(04)--MURAVEVA, K.K., KALINKIN, I.P., ALESKOVSKIY, V.B., BOGOMOLOV,
N.S.

COUNTRY OF INFO--USSR

SOURCE--THIN SOLID FILMS 1970, 5(1), 7-14

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, MATERIALS

TOPIC TAGS--CHALCOGENIDE GLASS, SINGLE CRYSTAL FILM, CADMIUM SULFIDE,
SELENIDE, TELLURIDE, ZINC COMPOUND, EPITAXIAL GROWTH, ELECTRON MOBILITY,
PHYSICAL PROPERTY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/0915

STEP NO--NE/0000/70/005/001/0007/0014

CIRC ACCESSION NO--AP0124576

UNCLASSIFIED

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2/2 020

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0124576

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EPITAXIAL GROWTH OF CDS, CESE, CDTE, ZNS, ZNSE, AND ZNTE FILMS ON MICA BY CONDENSATION IN A VACUUM OF 10^{-4} TO 10^{-5} PRIME NEGATIVES TORR HAS BEEN INVESTIGATED OVER A WIDE RANGE OF TEMPS. RELATIONS BETWEEN EVAPN. TEMP. T_{SUBEV} AND THE EPITAXIAL TEMP. T_{SUBEP} OF SINGLE CRYSTAL FILMS (T_{SUBEV} EQUALS A $\text{SUB1} + T_{\text{SUBEP}}$ AT T_{SUBEP} IS SMALLER THAN OR EQUAL TO 310°C AND T_{SUBEV} EQUALS A $\text{SUB2} - 2T_{\text{SUBEP}}$ AT T_{SUBEP} IS GREATER THAN OR EQUAL TO 320°C) AS WELL AS THOSE OF THE TEMP. CONDITIONS OF GROWTH OF SINGLE CRYSTAL FILMS TO MOL. WT. OF CHALCOGENIDES HAVE BEEN OBTAINED. THE MOST PERFECT SINGLE CRYSTAL FILMS GROW AT EPITAXIAL TEMPS. OF 300 – 320°C . THE RELATION OF THE CURRENT CARRIER MOBILITY AND SP. RESISTANCE TO THE TEMP. CONDITIONS OF THE SINGLE CRYSTAL FILM GROWTH HAS BEEN INVESTIGATED. THE FILMS OBTAINED EXHIBITED A GREAT VARIETY OF PROPERTIES, E.G. SINGLE CRYSTAL CDSE FILMS HAVE BEEN SYNTHESIZED WITH SP. RESISTANCE OF THE ORDER OF 10^{-1} TO 10^{-2} OHM CM WITH A SP. RESISTANCE OF THE ORDER OF 10^{-1} TO 10^{-2} OHM CM WITH QUITE HIGH ELECTRON MOBILITY OF 20 – 32 CM PRIME2-V SEC. FACILITY: LENSOVET INST. TECHNOL., LENINGRAD, USSR.

UNCLASSIFIED

USSR

UDC 621.382.2

KOVTONYUK, N. F., MOROZOV, V. A., FADIN, V. G., ~~BOGOMOLOV, P. A.~~, ALISULTANOV, YU. B., POTAPOV, I. S.

"Storage of Light Pulse Action in Metal-Dielectric-Semiconductor-Dielectric-Metal Structures Operating in the Prebreakdown Mode"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 6, No 3, 1972, pp 575-576

Abstract: A study was previously made of the phenomenon of accumulation of free carriers under the effect of pulse and stationary illumination in metal-dielectric-semiconductor-dielectric-metal structures in which there were no continuous currents through the dielectric layers [N. F. Kovtonyuk, et al., FTP, No 5, 1174, 1971]. A study has now been made of the case where significant leakage currents flow through the dielectric layers and accumulation of carriers does not occur in practice. Storage of the short light pulse action was detected. On inclusion of the voltage pulse in the absence of illumination of the sample, a capacitive current pulse is observed on the leading edge of the pulse. This capacitive current pulse is characteristic of structures without leakage. Then comes a segment where the continuous current has a comparatively low value (segment I) and only after this is a significant increase in the continuous current through the structure observed. After some time, it

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USSR

KOVTONYUK, N. F., et al., Fizika i Tekhnika Poluprovodnikov, Vol. 6, No 3, 1972, pp 575-576

reaches a constant value (segment II). The length of segment I is less the greater the voltage pulse amplitude. The magnitude of the saturation current in segment II approaches saturation with an increase in voltage. Under the effect of a light pulse, a photoconductivity signal is observed in segment II. Current oscillograms and the length of segment I and magnitude of the current of segment II as functions of the voltage pulse amplitude are presented.

Structures were manufactured so that the dielectric resistance was commensurate with the semiconductor resistance, and it was discovered that the sensitivity of such structures is no lower than in good metal-dielectric-semiconductor-dielectric-metal structures operating in the pulse accumulation mode. The data indicate that the prebreakdown operating mode of the investigated structures can be used in creating dynamic storage elements and also certain types of photoreceivers.

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USSR

UDC: 669.295:621.785.532.062.5

BOGOMOLOV, V. A., and GOVOROV, A. A.

"Effect of the Structure of VT3-1 Titanium Alloy on the Nature of Diffusion Due to Nitriding"

Moscow, Metallovedeniye i termicheskaya obrabotka metallov, Sept 71, no 9, pp 60-61

Abstract: Earlier research indicates the adverse effect of extrinsic atoms which are unevenly distributed between phases and cause the formation of a surface diffusion layer on subsequent chemical heat treatment. This report concerns the nitriding of the commercial VT3-1 alloy of $\alpha+\beta$ composition and of specimens with equilibrium and nonequilibrium initial structures. The results show that the initial structure in titanium alloys of $\alpha+\beta$ composition affects both the rate and mechanism of nitrogen diffusion on subsequent nitriding. In metastable solid solutions α'' (α')+ $\alpha+\beta$ and α' nitrogen diffusion is effected at a high rate at which the critical nitrogen concentration for nitride formation is not reached. In solid solutions with equilibrium $\alpha+\beta$ structures, nitrogen diffusion occurs at a slower rate and produces a surface nitride zone with a high nitrogen con-

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BOGOMOLOV, V. A., et al, Metallovedeniye i termicheskaya obrabotka metallov, Sept 71, no 9, pp 60-61

centration which inhibits diffusion. Thus, the nitriding of a VT3-1 titanium alloy of $\alpha+\beta$ composition with a metastable initial structure produced by quenching from near-critical temperatures results in nitrogen diffusion rates higher than those with stabilized initial structures.

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1/2 040 UNCLASSIFIED
TITLE--COMPARATIVE STUDY OF EQUATIONS OF STATE FOR PRODUCTS FROM THE
EXPLOSION OF ORGANIC LIQUIDS -U-
AUTHOR-(02)-VOSKOBOYNIKOV, I.M., BOGOMOLOV, V.M.
COUNTRY OF INFO--USSR
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SUBJECT AREAS--PROPULSION AND FUELS, CHEMISTRY
TOPIC TAGS--EXPLOSION, COMBUSTION PRODUCT, HIGH TEMPERATURE EFFECT, HIGH
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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE APPLICABILITY OF THE EQUATION OF STATE OF MOL. CRYSTAL FOR DETN. OF PROPERTIES OF GASES AT HIGH TEMPS. AND PRESSURES IS DISCUSSED. THE RESULTS OF CALCNS. ARE IN GOOD AGREEMENT WITH THE EXPTL. RESULTS OBTAINED AT DETONATION OF HIGH EXPLOSIVES. EQUATIONS FOR GENERALIZED EXPRESSION OF THE ADIABATIC SHOCK CURVE FOR LIQUEFIED GASES AND EXPLOSION PRODUCTS ARE SUGGESTED. FACILITY: INST. KHIM. FIZ., MOSCOW, USSR.

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UDC: 53.082.52

BOGOMOLOV, V. N., SHUL'MAN, S. G., Physicotechnical Institute imeni A. F. Ioffe, Academy of Sciences of the USSR

"Using Tubular Indium Antimonide Single Crystals for Low-Voltage Current Converters"

Moscow, Izv. AN SSSR: Ser. Fizicheskaya, Vol 36, No 3, Mar 72, pp 529-530

Abstract: The authors discuss the electrical properties of low-voltage electric current converters (inverters and rectifiers) based on tubular single crystal indium antimonide magnetoresistors. High conversion efficiency is obtained by making the devices in the form of Corbino disks cut from tubular single crystals grown by the Stepanov method. It is pointed out that the efficiency could be increased to as much as 90% by using metals with higher electron mobility than InSb at low temperatures, such as bismuth, gallium and indium.

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UDC 621.438

BOGOMOLOV, Ye. N.

"On the Thermodynamics of an Air Cooled Gas Turbine Stage"

Kazan', Izvestiya Vysshikh Uchebnykh Zavedeniy, Aviatsionnaya Tekhnika, No 2, 1973, pp 97-106

Abstract: Formulas are derived for the determination of the efficiency and of other parameters of the stage of a gas turbine with cooled nozzle ring and cooled rotor for the case of cooled air release into the mainstream gas flow within the flow section limits of the stage. A quantitative evaluation of the discussed thermodynamic effects is given on illustrated calculation examples. They show the parameters of the turbine stage with air cooling and the influence of the preliminary curling of the rotor cooling air on the parameters of the stage with a cylindrical flow section. The rotor air consumption was found to have an essential thermodynamical influence on the efficiency of the turbine stage. The practical result of the thermodynamical influence of the nozzle ring air consumption consists in a change of the rotor tip speed to flow rate relation. Three figures, one table, twenty five formulas, three bibliographic references.

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USSR

UDC 533.697:621.438

BOGOMOLOV, Ye. N.

"Edge Pressure and Losses in Turbine Cascades During Air Injection Into the Wake"

Kazan', Izvestiya Vysshikh Uchebnykh Zavedeniy, Aviatsionnaya Tekhnika, No 2, 1972, pp 73-83

Abstract: Results are presented of an experimental investigation of edge effects during subsonic flow past an individual flat blade and an annular cascade of turbine profiles during the presence of air injection into the wake from slits in the end of the exhaust edges. It was established that as the relative rate of blow-off increases, the edge pressure increases at first, and then decreases. An empirical relationship of the dimensionless pressure at the edge to the dimensionless value of the total head of the jets blown off into the wake is compiled. Results of measurement of head losses during flow past a blade with injection are compared with calculation data. There is indicated the possibility, in principle, of using the results of blow-downs of uncooled cascades for analysis of the efficiency of similar cascades under the conditions of blow-off of cooling air into the wake. An approximate formula is obtained for determining the optimal value, from the viewpoint of $1/2$

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BOGOMOLOV, Ye. N., Izvestiya Vysshikh Uchebnykh Zavedeniy, Aviatsionnaya Tekhnika, No 2, 1972, pp 73-83

edge losses in the cascade, of the relative flow rate of the blown-out air.
8 figures. 6 references.

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USSR

UDC 629.7.036.2

BOGOMOLOV, Ye. N.

"On the Place of Air Bleeding for Turbine Cooling of a Turbojet Engine for a Supersonic Airplane"

Kazan', IVUZ Aviatsionnaya Tekhnika, No 4, 1971, pp 123-128

Abstract : The effects of the turbine air cooling system on main parameters of a turbojet engine are discussed. It is demonstrated that the shift of the place of air bleeding for cooling to the side of decreased stage number of the compressor improves considerably the engine characteristics and widens the applicability range of internal air cooling of turbine blades. It was found that if, in case of cooling air bleeding from compressor, the relative consumption of the cooling agent decreases with increasing M of the flight, then, by air bleed into the cooling system from intermediate compressor stage, the reverse effect can take place. Four illustrations, 13 formulas, five biblio. refs.

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BOGOMOLOV, Yu. V.

"Absorption of an Extraordinary Electromagnetic Wave in a Bounded Magnetoactive Plasma"

Leningrad, Zhurnal Tekhnicheskoy Fiziki; Feb 72, pp 280-1

Abstract: The absorption coefficient of an electromagnetic wave in a bounded magnetoactive plasma with mirror and diffusion electron scattering at the boundary was calculated. A constant magnetic field was parallel to the boundary of the plasma, while the vector of the electrical field lay in the incident plane. The thermal action of the electrons was assumed to be weak. It was shown that for normal incidence of the wave the absorption coefficients for mirror and diffusion boundaries coincide in order of magnitude. The case of low frequencies constitutes the exceptions. In this limiting case oblique incidence of the wave was considered, and it was shown that the absorption coefficient for the mirror boundary is considerably less than that for diffusion absorption.

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UDC: 539.374

BOGOMOLOV, Yu. S.

"Effect of the Mechanical Properties of Materials on the Deformed State of Cylindrical Specimens Under Radial Compression"

Izv. Tomsk. politekhn. in-ta (News of Tomsk Polytechnical Institute), 1970, 157, pp 61-66 (from RZh-Mekhanika, No 7, Jul 71, Abstract No TV410)

Translation: The paper presents the results of an experimental study of the effect of the mechanical properties of a material on the deformed state of cylindrical specimens subjected to radial compression between flat plates. The deformed state was studied by the method of coordinate grids rolled on the end faces of the specimens. The cylindrical specimens were made from structural steel, Kh18N9T steel, bronze, brass, LS-59 and Duralumin. Photographs of the deformed coordinate grids are presented, and the nature of deformation of the specimens under radial compression is described. Curves are given for the distribution of the principal deformations along the axes of symmetry for specimens of different materials. It is shown that differences in hardening of the metals have little effect on the deformed state of the specimens during radial compression of cylinders. Ye. M. Tret'yakov.

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